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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Jay H. DOWLING et al

Serial No: **09/151,764**

Filed : **September 11, 1998**

For : **OPTICAL SYMBOLOGIES IMAGER**

Group Art Unit: **2876**

Examiner: **J. Fureman**

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APPLICANT'S APPEAL BRIEF
UNDER 35 U.S.C. §1.192

Commissioner of Patents and Trademarks
Washington, DC 20231

Sir:

By notice of the Appeal filed on August 12, 2002, applicants have appealed the final rejections dated March 12, 2002 and submit this brief in support of that appeal. It is noted that applicant by a accompanying amendment has limited the claims on appeal to claims 25, 27, 36, 40-43 and 49-51.

(1) REAL PARTY IN INTEREST

The real party in interest is the assignee, Robotic Vision Systems Inc., as evidenced by the Assignment of the inventors, Dowling et al. recorded at Reel 010354, frame 0713 in the United States Patent and Trademark Office.

(2) RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences regarding the present application.

(3) STATUS OF CLAIMS

Claim 1 has been withdrawn from consideration.
Claim 2 has been withdrawn from consideration.
Claim 3 has been withdrawn from consideration.

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Claim 4 has been withdrawn from consideration.
Claim 5 has been withdrawn from consideration.
Claim 6 has been withdrawn from consideration.
Claim 7 has been withdrawn from consideration.
Claim 8 has been withdrawn from consideration.
Claim 9 has been withdrawn from consideration.
Claim 10 has been withdrawn from consideration.
Claim 11 has been withdrawn from consideration.
Claim 12 has been withdrawn from consideration.
Claim 13 has been withdrawn from consideration.
Claim 14 has been withdrawn from consideration.
Claim 15 has been withdrawn from consideration.
Claim 16 has been withdrawn from consideration.
Claim 17 has been withdrawn from consideration.
Claim 18 has been withdrawn from consideration.
Claim 19 has been withdrawn from consideration.
Claim 20 has been withdrawn from consideration.
Claim 21 has been withdrawn from consideration.
Claim 22 has been withdrawn from consideration.
Claim 23 has been withdrawn from consideration.
Claim 24 has been withdrawn from consideration.
Claim 25 has been rejected.
Claim 26 has been cancelled.
Claim 27 has been rejected.
Claim 28 has been withdrawn from consideration.
Claim 29 has been withdrawn from consideration.
Claim 30 has been withdrawn from consideration.
Claim 31 has been withdrawn from consideration.
Claim 32 has been withdrawn from consideration.
Claim 33 has been withdrawn from consideration.
Claim 34 has been withdrawn from consideration.
Claim 35 has been withdrawn from consideration.
Claim 36 has been rejected.
Claim 37 has been withdrawn from consideration.
Claim 38 has been withdrawn from consideration.
Claim 39 has been withdrawn from consideration.
Claim 40 has been rejected.

Claim 41 has been rejected.
Claim 42 has been rejected.
Claim 43 has been rejected.
Claim 44 has been cancelled.
Claim 45 has been cancelled.
Claim 46 has been cancelled.
Claim 47 has been cancelled.
Claim 48 has been cancelled.
Claim 49 has been rejected.
Claim 50 has been rejected.
Claim 51 has been rejected.
Claim 52 has been cancelled.
Claim 53 has been cancelled.
Claim 54 has been cancelled.
Claim 55 has been cancelled.

(4) STATUS OF AMENDMENTS

An Amendment was filed on February 12, 2003, cancelling claims 44-48 and 52-55. This was the only Amendment filed after the Final Rejection of March 17, 2002.

(5) SUMMARY OF INVENTION

Applicant's invention relates to an optical symbology imager including a focusing disk 94 having a series of different thickness optical positions 132, the thickness of these positions being varied to focus an objective lens 92 onto a charge coupled device (CCD) detector 93 during image capture. (See page 12, lines 10-15) A first embodiment includes 12 optical positions 132 and a second embodiment includes 8 optical positions 132. (See Page 12, lines 15-23) The CCD detector 93 is used to determine which optical plate 132 and therefore which focusing zone is appropriate for a particular coded symbology scan. (See page 12, lines 24-26) As the disk 94 is rotated, illuminating light is reflected back through an objective lens 92 and through each of the optical positions 132 and then on to the CCD detector

93. In order to minimize the time it takes to focus the imager, only a fraction of the pixels of the CCD detector 93 are employed to determine the optimum optical plate, and therefore the focused optical plate. (See page 12, lines 24-30; page 13, line 1-2)

The CCD detector 93 contains 325,546 pixels. Therefore, if each of the pixels were used for each optical plate 132 of the focusing disk 94, the image capture procedure would take far too long. Therefore, to minimize the time required to obtain data for each optical plate 132, only a portion of the CCD detector would be used. In operation, the CCD detector 93 generates image data at 494 lines, one line at a time, each line being 659 pixels long. The first 246 lines instead of being digitized are scanned at a first rapid rate of speed. The next 10 lines are the only lines utilized in the analysis to determine the proper focus. These second set of lines are sampled at a second speed, less than the first rapid rate of speed. It is important to note that the present invention utilizes an electronic shutter which is open for only the time that it takes to analyze the above noted ten lines of the CCD detector 93. (See page 14, lines 3-20; and page 15, lines 4-5)

(6) ISSUES

The issue of this appeal is statutorily formulated in 35 U.S.C. Section 103. Specifically, the issue is whether the claimed invention recited in claims 25, 36, 40-43 and 49-51 are obvious over U.S. Patent 5,365,049 issued to <u>Peng</u> in view of U.S. Patent 5,563,658 issued to <u>Parulski et al</u>. Additionally, the Examiner deemed claim 27 to be unpatentable over <u>Peng</u> as modified by <u>Parluski et al</u> and further in view of U.S. Patent 5,510,604 issued to <u>England</u>.

(7) GROUPING OF CLAIMS

The present application includes only a single independent claim, namely claim 25, as all of the additional claims namely, claims 27, 36, 40, 41, 42, 43, 49, 50 and 51 are

directly dependent upon claim 25. These claims stand or fall together.

(8) ARGUMENTS

In the final Office Action of March 12, 2002, the Examiner indicated:

> Claims 25, 40-43, 49, 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peng (U.S. 5,365,049, previously cited) in view of Parulski et al (U.S. 5,563,658, previously cited).
>
> Re claims 25, 41-43, 49 and 50: Peng teaches an optical symbology imager, comprising: a multiple line charge coupled device (CCD)(18) having an active area, a focusing apparatus comprising a focusing disk (wheel 4) with multiple optical positions (reflective surfaces 7) to provide different focal lengths, the disk being rotatable so that each of the multiple optical positions can move into an optical path of the imager, a microprocessor (not shown) for controlling the focusing apparatus and operation of the CCD, so that the CCD performs image capture producing image data for each of the multiple optical positions, the microprocessor controlling the CCD to shift out the image data, the microprocessor evaluating transitions between light and dark data in a central set of multiple scan lines (Peng evaluates all of the scan liens of the CCD, thereby including the central set of scan lines) to produce a representative valve for each of the multiple optical positions, the multiple optical positions being at least two, and the multiple optical positions being eight (surfaces 7a-7h)(see Figure 6, column 1 lines 6-46, column 2 lines 3-26, column 2 line 61, column 3 line 12, column 4 lines 4-16, and column 7 line 47, Column 8 line 13).
>
> Peng fails to specifically teach shifting out the image data substantially serially, the largest representative value corresponding to one of the optical positions producing optimum focus, and the CCD having a resolution of 659 by 494.

However, it was well known to those of ordinary skill in the art at the time of the invention to shift out image data from a CCD substantially serially, that when an image is in a focused position it will provide the highest contrast between different portions of the image, furthermore, CCD's having a resolution of 659 by 494 were well known to those or ordinary skill in the art at the time of the invention (as applicant's acknowledge on page 3, lines 1-11, and page 11, lines 28-32 of the specification.)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to integrate, with the system as taught by Peng, shifting out the image data substantially serially, the CCD having a resolution of 659 by 494, in order to provide a CCD suitable for reading the intended images that has an output that is widely accepted, and the largest representative value corresponding to one of the optical positions producing optimum focus, in order to accurately determine the best focus position.

Peng fails to teach the CCD disposing of a first set of multiple scan liens at a first rate of speed during focusing and then sampling a second subsequent set of multiple lines from the central set of scan lines at a second rate of speed less than the first rate of speed during focusing, the second set of multiple lines being substantially ten lines, the microprocessor only utilizing the central set of multiple lines to produce the optimum focus.

Parulski et al teaches disposing of a first set (68) of multiple scan lines of a CCD (20) at a first rate of speed ("fast flush" mode focus mode) during focusing and then sampling a second subsequent set (center region 66) of multiple lines from the central set (the center section of the imager) of scan lines at a second rate of speed less than the first rate of speed during focusing, the second set of multiple liens being substantially ten lines (for example 4, 8, or 16 lines), the micro-processor (processor section 36) only utilizing the central set of multiple lines to produced the optimum focus, in order to reduce the amount of time needed for focusing (see column Figures 1, 3, column 2

> line 60, column 3 line 3, column 4 line 29, column 5 line 14, and column 6 lines 60-64).
>
> In view of Parulski et al's teachings, it would have been obvious to one of ordinary skill in the art at the time of the invention to integrate, with the system as taught by Peng, the CCD disposing of a first set of multiple scan lines at a first rate of speed during focusing and then sampling a second subsequent set of multiple lines from the central set of scan lines at a second rate of speed less than the first rate of speed during focusing, the second set of multiple lines being substantially ten lines, the microprocessor only utilizing the central set of multiple lines to produce the optimum focus, in order to reduce the amount of time needed for focusing, thereby providing a faster system.

The United States Supreme Court interpreted the standard for 35 U.S.C. Section 103 in <u>Graham v. John Deere</u> 383 U.S.1, 148 USPQ 495 (1966). In <u>Graham</u> the Court stated that under 35 U.S.C. Section 103:

> The scope and content of the prior art to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined. 148 USPQ at 467.

Using the standard set forth in <u>Graham</u>, the scope and content of the prior art relied upon by the Examiner will be determined.

The patent to <u>Peng</u> is directed to a device utilizing a reflected focusing apparatus to obtain the focal length change. Additionally, the <u>Peng</u> patent, as described in Column 2, lines 26-50, employs a symmetrical lens system that can only operate with small aberrations and magnifications near 1:1. When used as magnifications not near 1:1, a symmetrical lens can be at a severe disadvantage. Furthermore, as illustrated in Figure 5, light generated from a laser 10 would first pass through a lens system 1 before being directed to the reflection means 2 including a rotating wheel 4. After being reflected by the wheel

4, the laser beam passes through the lens system 1 and through a beam splitter 12 before being impinged upon a sweep generator 13 which directs the laser beam to a bar code C. Figure 6 shows a system in which the light from the bar code C is forced to pass through the lens 1 twice.

The present system does not force the use of a symmetrical optical configuration and therefore can provide relatively small aberrations with any type of lens arrangement, symmetrical or not. During focusing of the present invention, the charge control device disposes of a first set of multiple lines at the first rate of speed, and then samples the central set of lines at a second rate of speed less than the first rate of speed. As admitted by the Examiner, the patent to <u>Peng</u> would evaluate all of the scanned lines. The present invention as presently recited in independent claim 25 and indirectly in all of the additional claims under appeal, scans a central set of lines at the lower speed then the first set of multiple lines. As indicated hereinabove, the Examiner indicated that <u>Parulski et al</u> teaches disposing a first set (68) of multiple scan lines of a CCD (20) and a first rate of speed ("fast flush" mode focus mode) during focusing and then samples a second subsequent set (center area 66) of multiple lines from the central set (the center section of the imager) of scan lines at a second rate of speed less than the first rate of speed during focusing. However, it is respectfully submitted that the patent to <u>Parulski et al</u> does not specifically recite a camera in which the multiple lines of the center 66 is scanned at a second rate of speed less than the first rate of speed. The timing scheme for operating the electronic camera of <u>Parulski et al</u> to focus an image is recited in column 5, lines 61-67 and column 6, lines 1-5. As specifically indicated therein:

> The camera focus is adjusted to a mid-range position while the shutter 24 is open and the sensor 20 is cleared of any charges using the fast flush operating mode for the entire sensor. An image, to be used for focusing the camera lens, is then integrated for a period of time, for example, 10 mSec. During this imaging cycle, the shutter 24 remains open while a top portion of the

> image is rapidly readout and discarded, using "fast flush" clocking where the vertical and horizontal registers are continually clocked. The vertical clock sequence is then returned to the normal read out position, while a small number of lines in the center region 66 of the image are clocked out."

Therefore, although one might by the very nature of the term "fast flush" imply that a relatively high scan speed is used to eliminate the images provided in the outer area 68 as shown in Figure 2 of Parulski et al, this would not necessarily imply that the information included in the focusing area 66 is readout at a second speed slower than the "fast flush" speed. Although the purpose of the autofocus mode using the "fast flush" speed appears to be utilized to speed up refocusing of the camera, this speed up could be accomplished by eliminating the material in area 68 at the same rate that material in area 66 would be read. If this were accomplished, speed of the autofocusing mode would be greatly enhanced. There is nothing in the Parulski et al patent which indicates that the two scan speeds must be different. Although the Examiner specifically indicated in the Examiner's rejection that the Parulski et al reference teaches scanning the center section of the imager at a second rate of speed less than the first rate of speed, in paragraph 10 of the final rejection, the Examiner concedes that this teaching is not shown in the Parulski reference by specifically indicating:

> In response to applicant's argument that Parulski et al does not teach the CCD disposing of a first set of multiple scan lines at a first rate of speed during focusing and then sampling a second subsequent set of multiple lines from the central set of scan lines at a second rate of speed less than the first rate of speed during focusing (see pages 3 and 4 of the amendment filed on 12/18/2001). Parulski et al teaches that during "fast flush" focusing mode, a top portion of the image is rapidly read out and discarded, then a small number of lines in the center region 66 of the image are clocked out using the normal readout operation, then the remainder of the image charge is cleared out (see Figures 3, 6, column 4 line 65 - column 5 line 13,

> column 5 line 58 - column 6 line 11). Since the "fast flush" mode produces an unusable signal, if the entire image was read out using the "fast flush" mode, there would be no usable signal to determine focus. Clearly, as taught by Parulski et al, the center region 66 is a read out at a slower rate than the remainder of the image.

As previously indicated, there is no specific teaching in the Parulski et al reference indicating a first scan rate of multiple lines as well as sampling a second subsequent set of multiple lines from a central set of lines at a second rate of speed less than the first rate of speed during focusing. It is respectfully submitted that contrary to the Examiner's conclusion, the "fast flush" mode could produce a usable signal, if this signal would be sampled at the "fast flush" rate of speed. What the Examiner also fails to appreciate is that a usable signal can be produced by utilizing only the subject matter in the central focusing area 66 even if this material is sent to horizontal register 60 at the same rate that the material in the outer area 68 is eliminated from that area. Although this signal would not produce an optimum output at this fast speed, the signal would still be usable. The present invention as illustrated in claim 25 specifically indicates that the CCD disposes a first set of multiple lines and a first rate of speed during focusing and then samples a second subsequent set of multiple lines from the central set of scan lines at a second rate of speed less than the first rate of speed during focusing. By so doing, the present invention provides an optical symbology imager providing a quick and accurate focus. There is actually no teaching in the Parulski reference that specifically indicates that there are two scan rates.

It is respectfully submitted that the Examiner is using applicant's own teaching in relying on impermissible hindsight to conclude that two different scan rates must be utilized in the Parulski et al reference. In contrast to the Examiner's position, there is no teaching in the Parulski et al reference which mandates these two different scan rates.

A rejection based upon Section 103 must rest on a factual basis, with the facts being interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, the Examiner has the initial duty of suppling the factual basis for the rejection that is advanced. The Examiner may not, because the Examiner doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. Applicants respectfully submit that there is no factual basis in the Parulski et al reference which supports the Examiner's position that two different scan rates were used in the Parulski et al reference, and that the Examiner stated conclusion of obviousness is based upon speculation and hindsight of the invention recited in claim 25. Claims 40-43, 49, 50 and 51 also were rejected as being unpatentable over the Peng reference in view of Parulski et al for the reasons cited hereinabove. For the reasons enunciated hereinabove, it is believed that since claim 25 recites patentable subject matter, these additional claims also recite patentable subject matter.

Claim 36 was rejected as being unpatentable over Peng modified by the Parulski et al reference and further in view of the admitted prior art relating to a hand held optical symbology imager. Since this claim is dependent from claim 25, it is believed that this claim also recites patentable subject matter.

Claim 27 was rejected as being unpatentable over Peng as modified by Parulski in view of U.S. Patent 5,510,604 issued to England. Since it is believe that claim 25 to which claim 27 depends recites patentable subject matter, claim 27 would also recite patentable subject matter.

There is a fundamental axiom in patent law that if a reference must be reconstructed or rearranged to meet applicant's claims, the modification of that reference is inappropriate and cannot stand. The only manner in which the Parulski et al reference can be applied to independent claim 25 and all claims dependent therefrom, is if Parulski et al recites an automatic focus mode in which there are two scans of differing speed. Since there is no teaching in Parulski et al to substantiate this

position, it is respectfully believed that the Examiner has used hindsight with respect to the applicant's own teachings to make this assumption. Since there is no teaching in the prior art cited by the Examiner utilizing the two different scan speed as directly recited in independent claim 25 as well as all claims depending therefrom, it is believed that the present invention as claimed is patentable.

In conclusion, it is respectfully submitted that the rejection of claims 25, 27, 36, 40-43 and 45-51 are improper and should be reversed.

Respectfully submitted,

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June 12, 2003

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APPENDIX

The claims on appeal read as follows:

25. An optical symbology imager, comprising:

a multiple line charge coupled device (CCD) having an active area;

a focusing apparatus comprising a focusing disk with multiple optical positions to provide different focal lengths, said disk being rotatable so that each of said multiple optical positions can move into an optical path of said imager;

a microprocessor for controlling said focusing apparatus and operation of said CCD, so that said CCD performs image capture producing image data for each of said multiple optical positions;

said microprocessor controlling said CCD to shift out said image data substantially serially;

said microprocessor evaluating transitions between light and dark data in a central set of multiple lines to produce a representative value for each of said multiple optical positions, wherein a largest representative value corresponds to one of said optical positions producing optimum focus; and

wherein said CCD disposes of a first set of multiple lines at a first rate of speed during focusing, and then samples a second subsequent set of multiple lines from said central set of scan lines at a second rate of speed less than said first rate of speed during focusing.

27. An optical symbology imager as recited in claim 25, wherein said representative value is produced by totaling a first seven to ten values from multiple values produced for each of said multiple focusing positions.

36. An optical symbology imager as recited in claim 25, wherein said optical symbology imager is hand-held.

40. An optical symbology imager as recited in claim 25, wherein said first set of multiple lines is 246 lines.

41. An optical symbology imager as recited in claim 25, wherein said second set of multiple lines is substantially ten lines.

42. An optical symbology imager in accordance with claim 25 wherein said multiple line CCD has a resolution of 659 by 494.

43. An optical symbology imager in accordance with claim 25, wherein said microprocessor only utilizes said central set of multiple lines to produce the optimum focus.

49. An optical symbology imager in accordance with claim 25, wherein said multiple optical positions are at least two.

50. An optical symbology imager in accordance with claim 25, wherein said multiple optical positions are eight.

51. An optical symbology imager in accordance with claim 25, wherein said multiple optical positions are twelve.